

COLOURED THINKING AND ALLIED CONDITIONS.—BY D.  
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There are certain persons in whom sounds are invariably and inevitably associated with colours. Whether these sounds are those of the human voice or the notes of various musical instruments, they are all heard as coloured. This kind of thing is known as coloured hearing; in French, *audition colorée*; in German, *farbiges Hören*.

The linking together of any two kinds of sensation is called synæsthesia; of all the possible synæsthesiæ, the linking of colour and sound is the commonest. A larger number of persons than might be supposed are the subjects of coloured hearing. As long ago as 1864, the chromatic associations of one of these coloured hearers were described by Benjamin Lumley<sup>(2)</sup>. "I know a person," he wrote, "with whom music and colours are so intimately associated that whenever this person listens to a singer, a colour corresponding to his voice becomes visible to his eyes, the greater the volume of the voice the more distinct is the colour." This person heard Mario's voice as violet, Sims Reeves' as gold-brown, Grisi's as primrose, and so on.

But there is also a small number of persons who, whether they hear in colours or not, always *think* in colours. These persons, called coloured thinkers, do not have any sensation of colour when voices or notes are heard, but they invariably associate some kind of colour with such things as the names of the days of the week, the hours of the day, the months of the year, the vowels, the consonants, etc. This faculty is coloured thinking or chromatic conception and has been called psychochromæsthesia. A typical coloured thinker

who will tell you, for instance, that Sunday is yellow, Wednesday brown, Friday black, may not experience any sensation of colour on hearing the organ played or a song sung. Certain persons are indeed coloured hearers as well as coloured thinkers; but we should distinguish the person who has linked sensations, a synæsthete, from the person whose thoughts are coloured, whose mentation is chromatic, who is, in fact, a psychochromæsthete.

The literature of synæsthesia is much more extensive than any one would be inclined to think who had not made it a special study. Nor is the condition described only in technical publications; there is an increasing tendency to recognize it in current fiction. Thus in "Dorian Grey" we have—"her voice was exquisite, but from the point of view of tone it was absolutely false. It was wrong in colour". Musicians, it would appear, are particularly liable to hear in colours—"The aria in A sharp (Schubert) is of so sunny a warmth and of so delicate a green that it seems to me when I hear it that I breathe the scent of young fir-trees". The musical critic of the "Birmingham Daily Post" thus once complained of a lady's singing; "Her voice should have been luscious like purple grapes". Punch has, of course, not failed to notice this tendency in musical criticism. A writer in the "Daily Telegraph" had thus expressed himself—"To a rather dark coloured, deep, mezzo-soprano voice, the singer joins a splendid temperament"; Punch remarked, "We, ourselves, prefer a plum-coloured voice with blue stripes or else something of a tartan timbre".

Monsieur Peillaube<sup>(63)</sup>, editor of the *Revue Philosophique*, has reported on four persons who have well marked coloured hearing for organ notes, and he calls attention to the numerous cases amongst musicians of definite associations between notes and musical instruments on the one hand, and colours on the other as well as between whole pieces of music and colours. Thus Gounod, endeavouring to express the dif-

ference between the French and Italian languages and giving his preference to the former, used terms relating to colours: "Elle est moins riche de coloris, soit, mais elle est plus variée et plus fins de tintes".

Theoretically, any two sensations may be linked, so that coloured hearing is only one particular variety of synæsthesia (coupled sensations, secondary or dual sensations, second-*ärempfindungen*). No doubt the linking of colour with sound is the commonest of these dual sensations which, following Bleuler<sup>(31)</sup>, might be called sound-photisms. When a taste produces light or colours we have a taste-photism; similarly, there are odour-photisms, touch-photisms, temperature-photisms, and pain-photisms recorded in the annals of abnormal psychology. A good example of pain-photism occurs in a recent novel, "The Dream Ship"<sup>(66)</sup>. The whole passage is so appropriate to our subject that it may be quoted in full:—"Bran" (a boy) "decided all his likes and dislikes by colour and smell. His favourite colours were yellow, red, green, and wet-black. The last was very different to (*sic*) ordinary black which was the colour of toothache. Little rheumatic pains, which he sometimes got in his knees, were grey. The worst pain you could get was a purply-red one which came when you were sad and gave you the stomach ache. He had once solemnly stated that the only colour he hated was yellow-pink, but as he always called yellow pink and pink yellow, no one had been able to solve the riddle of this hated colour." The black colours of toothache and the grey of rheumatism were this boy's pain-photisms. Something of the reverse order is indicated where a disagreeable colour is described as producing a pain in the stomach. When Baudelaire said that musk reminded him of scarlet and gold, he had an odour-photism.

When the reverse linking occurs, we have an analogous series as follows,—If light or colour produces a sound, it is

a light- or colour-phonism. When a taste is coupled with a sound, we have a taste-phonism and there may exist odour-, touch-, temperature- or pain-phonisms respectively. Sometimes the second sensation linked is of a more vague character, as when screeching sounds produce disagreeable general sensations very difficult to describe. They have been called secondary sensations of general feeling, and they may be akin to those unpleasant sensations evidently experienced by dogs and other animals when they hear music. The late Mr. Grant Allen was evidently alluding to this kind of thing when he wrote in an article on "Scales and Colours," that "Chaos was in dark and gloomy colours, whereas light was treated in white" in such a work as Hadyn's "Creation."

Bleuler<sup>(31)</sup> believes that phonisms of high pitch are produced by bright lights, well defined outlines, small and pointed forms, whereas phonisms of low pitch are produced by the opposite conditions. An interesting point may be mentioned in connexion with the difference in colour aroused by spoken words and by whispering. Dr. Hélène Stelzner<sup>(5)</sup> tells us that in her own case full-toned speech appears as a coloured picture, whereas whispering, with its much less resonant vowels, appears like a copper-plate engraving, that is, as non-chromatic.

Quite apart from all these things—synæsthesia—is coloured thinking or chromatic mentation. Here it is not a question of a sensation being present at all, it is that certain persons who have this power, faculty or disability cannot visualize any concept without seeing it in "the mind's eye" as coloured in some way or other. Indeed, the majority of the coloured thinkers questioned by the author do not experience colours when they hear sounds or musical tones, but they cannot think of anything definitely, the month, the day, the hour, without its being thought of as red or yellow or black or white or brown or green or blue. There

is no approach towards unanimity in the colours thought of in association with any one concept or word; for instance, for Saturday the colours selected at random from records in my possession are white, yellow, steel-grey, white-grey, crimson, brown. The coloured thought may be called a psychochrome, and persons who think in colours psychochromæsthetes, the faculty or disposition to think in colours being psychochromæsthesia. Something analogous to this is the case of the blind man alluded to by Locke<sup>(1)</sup> to whom scarlet was "like the sound of a trumpet."

Apparently the concepts to be most commonly coloured are those for the vowels, the consonants, the months, the days, and the hours of the day. Thus the vowel "a" as in "fame" is mentally coloured in the following five ways in five different persons—red, black, green, white-grey, and white respectively. Or take the vowel "u" as in "usual", we find it psychically coloured as grey-white, yellow, black, brown, blue, and green in six different coloured thinkers. Similarly whole words are associated with colours in the minds of this class of thinkers. One person says he divides all words into two great classes, the dark and the light. Random examples of dark words are man, hill, night, horse, Rome, London, and of light, sea, child, silver, year, day, and Cairo. Or again, another coloured thinker divides up the numerals into those associated with cold colours, grey, black, blue, green; and those with warm, red, yellow, orange, brown, purple, and pink. The odd numbers have the cold colours; the even, the warm. In some cases, as might be expected, the coloured concepts are appropriate or natural as when the word scarlet is scarlet; black, black; and white, white. But an examination of psychochromes shows us that this reasonableness does not necessarily always occur. Thus, the word "apple" is to one coloured thinker a slate grey, which is not the colour of any real apple; and the word "cucumber" to the same person is white; now only the inside of the vegetable itself is white.

Some kind of method, however, may be traced in this chromatic madness, for, according to Bleuler<sup>(31)</sup> high-pitched notes produce the lighter tints of colour, but low-pitched the darker shades. According to this authority, the colours oftenest aroused in the synæsthesia, sound-photism, are dark brown, dark red, yellow, and white, which is not at all the statement of the frequency of occurrence of colours in coloured thinking. From the records of the psychochromes of two brothers, the relative order of frequency of the colours is white or grey, brown, black, yellow, red, green, and blue; violet and indigo not occurring. Dr. Hélène Stelzner<sup>(5)</sup> says that green is the colour least commonly thought of. But individual differences are extreme: thus both purple and violet are such favourites with some coloured thinkers that they hardly ever think in terms of any other colours. The present writer<sup>(56)</sup> has examined the psychochromes of two men, one woman, and one child, with the result that the relative order of frequency of occurrence comes out as white, brown, black, yellow, green, blue, red, pink, cream, orange, and purple. It is thus clear that the colours thought of are not exclusively the pure or spectral ones, for certain non-spectral colours like brown, pink, cream, white, and black are quite commonly reported. The novelist, Ellen Thornycroft Fowler, in a private communication to the author, wrote—"The colour which I always associate with myself, for no earthly reason that I can discover, is blue. Therefore, "E", my initial letter is blue; April, the month of my birthday is blue, and 9, the date of my birthday, is blue." This is known as "colour individuation", and has been made a special study of by Paul Sokolov<sup>(47)</sup> in his paper "L'individuation colorée" read before the fourth international congress of Psychology held at Paris, 1900. Some people, in short, have their favourite colours, and with these they invest their pleasant thoughts, while their unpleasant thoughts they find coloured by the tints they are not fond of.

Apart, however, from whether certain colours are favourites or not, some few persons have the consciousness of a colour more or less present with them. Thus, R. L. Stevenson had, so he tells us, a feeling of brown which, during his attacks of fever, was unusually distinct. It was "a peculiar shade of brown, something like sealskin".

As might be expected, so acute an observer as Mr. Rudyard Kipling has not failed to notice coloured thinking. In his very curious story "They",<sup>(52)</sup> he describes the colour concepts experienced by a blind old lady who opens an interview by complaining that certain colours—purple and black—hurt her. Her visitor asks, "And what are the colours at the top of whatever you see?" "I see them so," she replies, "white, green, yellow, red, purple; and when people are very bad, black across the red, as you were just now." The old lady goes on to say that ever since she was quite a child some colours hurt her, and some made her happy. "I only found out afterwards that other people did not see the colours." So unfamiliar is coloured thinking to the ordinary person that a critic wrote (*The Academy and Literature*, October 8th, 1904) "Such tales as 'They' are sheer conundrums." Another writer asked more pertinently, "Are the colours the blind woman described, the colours of different thoughts?"

In Mrs. Felkin's novel, *In subjection* <sup>(43)</sup> (1900), the heroine, Isabel Seton, is evidently a coloured thinker. Some of her colour associations are given on page 149. The novelist, in a letter to the writer, was good enough to explain that these experiences of her heroine are based on those of an actual prototype, some of whose additional psychochromes she has kindly mentioned. Isabel Seton has synæsthesia also, for the actual sounds of voices call up colours. Thus, soprano voices are to her pale blue or green or yellow or white; contraltos are pink or red or violet; tenors are different shades of brown; while basses are black or dark green or navy blue.

In the novel *Christopher* by Richard Pryce, <sup>(61)</sup> there is an interesting allusion to a boy who is described as not morbid although he is evidently a synæsthete and a coloured thinker. He talks of playing the sunset on the piano (a colour-phonism), and of smelling moonlight (a light-olfaction). In a novel, *Youth's Encounter*, <sup>(64)</sup> published in the year 1913 we are told that to one of the characters, "Monday was dull red, Tuesday was cream-coloured, Thursday was dingy purple, Friday was a harsh scarlet, but Wednesday was vivid apple-green, or was it a clear, cool blue?"

It is difficult to express the character of these coloured concepts to persons—and they are the majority of people—who never experience this sort of thing at any time. The colours are not present so vividly as to constitute hallucinations. Coloured visualizings never become hallucinatory, possibly because they are of the nature of thoughts, rather than of subjective sensations. Chromatic conception belongs to the physiology not to the pathology of mind. Coloured thinkers are not continually plagued with phantasmagoria. Mental colourings do not obtrude themselves into one's mental life, they are habitual, natural, chromatic tincturings of one's concepts, and have been so long present to consciousness that they have long ago become part of one's mental belongings. They are invariable and definite without being disturbing.

One coloured thinker has thus expressed himself: "When I think at all definitely about the month of January, the name or word appears to me reddish, whereas April is white, May yellow, the vowel 'i' is always black, the letter 'o' white, and 'w' indigo-blue. Only by a determined effort can I think of 'b' as green or blue, for me it always has been and must be black; to imagine August as anything but white seems to me an impossibility, an altering of the inherent nature of things." There is thus an inherent definiteness, finality, and constancy about each thinker's psycho-



chromes that is very striking. But it is not alone letters and words that are habitually thought of as coloured, certain coloured thinkers always associate a particular colour with their thoughts about a particular person.

The author of "The Corner of Harley Street"<sup>(62)</sup> remarks (p. 251) "If only we could use colours now to express our deeper attitude on these occasions, as some of your fellow clergy wear stoles at certain seasons, with what pleasant impunity could we write to one another in yellow or purple or red, leaving black for the editor of the *Times* or the plumber whose bill we are disputing."

"Our alphabet is not rich enough for the notation of the cockney dialect", writes Mr. Richard Whiting in *No. 5 John Street*, "I can but indicate his speech system by a stray word which, if there is anything in the theory of the correspondence between sounds and colours, should have the effect of a stain of London mud." This is evidently an allusion to coloured thinking. There is, unfortunately, no theory at all as yet, but there is the fact of chromatic conception. Quite recently (1913) there was in the "British Review"<sup>(65)</sup> a vivacious article dealing with coloured thinking from the popular standpoint. The literature that contains the most systematic discussion of coloured thinking is that of the decadent poets of France, the symbolists, as they are called. Some account of their psychochromes is given in Lombroso's "Man of Genius"<sup>(60)</sup>. The eccentric poet, Paul Verlaine, belonged to this school. It evidently includes synæsthetes as well as coloured thinkers for, for them, the organ is black, the harp white, the violin blue, the trumpet red, and the flute yellow. But they think of the vowel "a" as black, "e" as white, "i" blue, "o" red, and "u" yellow. One of them, Stéphane Mallarmé, has explained in his pamphlet *Traité du Verbe* how these things have come to be.

dynamic and contact metamorphism. The former, as shown in Lunenburg and Halifax counties, produced thick-bedded compact quartzite, usually showing minute flakes of mica, and siliceous slates, usually of a grey-green color and very fine grain with no metacrysts. The metamorphism of these beds was not quite completed when the granitic intrusions of Middle Devonian age took place, for the igneous rock is everywhere more or less sheared. The contact metamorphism near the granite has produced recrystallized schist and quartzite, and farther away has caused the formation of metacrystals of staurolite, andalusite, biotite, hornblende, garnet and sillimanite.

In the southern portion of Shelburne County, the contact metamorphism has been so extensive as to be almost regional. On Negro Island, which is 10 miles from the nearest granite outcrop, the staurolites still persist in the schist although the quartzite is free from metacrysts. The characteristic features of the metamorphism are the development of either staurolite or mica or both in the schist everywhere, the recrystallization of the quartzite near the granite with the development of the muscovite in large quantities and some biotite, and the lack of alteration of the quartzite elsewhere, except near Sand Point where within three miles of the granite some metacrysts appear.

The date of the block faulting, which is shown on the map, is probably late Carboniferous. This diastrophic period did not develop intense folding in the Maritime Provinces, but it was accompanied by faulting. In Kings County the faulting is later than the intrusion of igneous rocks of Devonian age. The details concerning these faults have been sufficiently discussed above. Faults are characteristic of the Goldbearing series throughout its extent, but this block faulting is uncommon in the districts near the gold mines.

The following verses—for I hesitate to call them poetry—seem to be an attempt to express the associations of emotions symbolized by the mental colourings of the vowels:

## VOYELLES

A noir, E blanc, I rouge, U vert, O bleu, voyelles,  
Je dirai quelque jour vos naissances latentes;  
A, noir corset velu des mouches éclatantes  
Qui bombillent autour des puanteurs cruelles.

Golfes d'ombre, E, candeur des vapeurs et des tentes,  
Lances des guerriers fiers, rois blancs, frissons d'ombelles,  
I, pourpres, sang craché, rire des lèvres belles  
Dans la colère ou les ivresses pénitentes.

U, cycles vibrement divins des mers virides,  
Paix des pâtis semés d'animaux, paix des rides  
Que l'alchimie imprime aux grands fronts studieux.

O, suprême clairon plein de strideurs étranges,  
Silence traversée des Mondes et des Anges,  
O, l'omega, rayon violet des ses yeux.

*J. A. Rimbaud.*

We are now perhaps in a position to make some inquiry into the characteristic features of coloured thinking. The first point that strikes one is the very early age at which these associations are fixed. This was a feature recognized by Galton in his classic examination of the subject in 1883<sup>(10)</sup> The present author's observations fully confirm this point; he has in his possession many letters from coloured thinkers in which the details of their psychochromes differ in the widest possible manner, but all agree in that they testify to the very early age at which the associations were formed. After the publication of the writer's article in the "Scotsman," December 29th, 1908,<sup>(59)</sup> he received a number of letters spontaneously sent, all emphasising this feature in such

phrases as, "ever since I can remember", "ever since childhood I have always had it", "I do not remember the time when I had not", etc. A writer in "Nature" in 1891,<sup>(29)</sup> reports on the psychochromes of his daughter when seven years old, at which age she had specifically different colours for the days of the week, namely: blue, pink, brown or grey, brown or grey, white, white, and black. The months of the year were coloured in the following way by a girl of ten who had so thought of them ever since she could remember: brown, olive-green, "art" blue, green-yellow, pink, pale green, pale mauve, orange, orange-brown, grey, grey outlined in black and finally red.

A boy ten years old is reported in the article on Colour Hearing in the "British Review",<sup>(65)</sup> to have "noticed that the number eight invariably provoked in him the sensation of apricot-yellow, and the number fifteen that of peacock blue". There seems not the slightest doubt that these colour associations are amongst the earliest that are formed in the child mind of the coloured thinker.

The second characteristic of coloured thinking is the unchangeableness of the colour thought of. Middle-aged people will tell you that there has been no alteration in the colours or even in the tints and shades of colour which, for many years, they have associated with their various concepts. Galton remarked on this in his original monograph: "They are very little altered," he said, "by the accidents of education." Galton's phrase was they result from "Nature not nurture". Just as their origination is not due to the influence of the environment, so the environment exercises no modifying influence on them even during a long life.

The third characteristic of psychochromes is the extreme definiteness in the minds of their possessors. Contrary to what might reasonably be expected, the precise colours attached to concepts are by no means vague or incapable of accurate verbal description. A coloured thinker is most

fastidious in the choice of terms to give adequate expression to his chromatic imagery. One of these is not content, for instance, with speaking of September as grey, he must call it steel-grey; another speaks of a dull white, of a silvery white, of "the colour of white watered silk," and so on. One child speaks of March as "art blue," whatever that is; another of 6 p. m. as *pinkish*. The degree of chromatic precision which can be given by coloured thinkers to their visualizing is as extraordinary as any of the other extraordinary things connected with this curious subject.

The fourth characteristic is the complete non-agreement between the various colours attached to the same concept in the minds of coloured thinkers. Thus, nine different persons think of Tuesday in terms of the following colours: brown, purple, dark purple, brown, blue, white, black, pink, and blue. Again, September is thought of as pale yellow, steel-grey, and orange by three different coloured thinkers respectively. Once more, the vowel "i" is thought of as black, red-violet, yellow, white, and red respectively by five persons gifted with chromatic mentation. Unanimity seems hopeless, agreement quite impossible; the colours are essentially individualistic.

The fifth characteristic of psychochromes is their unaccountableness. No coloured thinker seems to be able to say how he came by his associations; "I cannot account for them in any way" is the invariable remark one finds in letters from persons describing their coloured thoughts.

The sixth characteristic is the hereditary or at least inborn nature of the condition. Galton's phrase was "very hereditary". The extremely early age at which coloured thinking reveals itself would of itself indicate that the tendency was either hereditary or congenital. The details of a case of heredity from father to son have been reported for coloured hearing by Lauret and Duchassoy; a case of coloured thinking reported by the present writer was one

of heredity also from father to son. But these related coloured hearers did not see the same colours for the same sound, nor did the two coloured thinkers think in the same colours. From the writer's inquiries, coloured thinking is certainly congenital even when it cannot be proved to be hereditary. This point will come up again in connexion with the origin of the condition, but we may at present note that those who have studied the subject are unanimous in denying that at any rate coloured thinking is due to environmental influences.

It may be now asked what manner of people are they who are coloured hearers or coloured thinkers or both. The late Mr. Galton told us that they are rather above than below the average intelligence. The writer's observation would, in the main, confirm this; they are at least invariably well educated persons who confess to being coloured thinkers. In his book, Mr. Galton gave a few names of distinguished persons of his acquaintance, and his list might be brought up to date by the addition of some names quite as distinguished. But all persons who have coloured hearing or coloured thinking are not necessarily distinguished—a large number, as we have seen, are yet children—but they are all probably more or less sensitive. Possibly they are more given to introspection than is the ordinary person. At any rate, what is quite certain is that both synæsthetes and psychochromæsthetes belong to the group of strong visuals or "seers" as Galton called them. Seers are persons who visualize or exteriorize their concepts either as uncoloured forms or as coloured in some way or other. The uncoloured thought-forms are very curious, some of which Galton gave as examples in the appendix to his work. One distinguished neurologist always sees the numerals 1 to 100 in the form of a ladder sloping upwards from left to right into the sky. As this concept is not coloured, it cannot be called a psychochrome, but it might be called a psychogram. A psychogram is,

then, the uncoloured thought-form of a concept, and people who have psychograms must be strong visualizers.

The school of symbolist poets in France to which Ghil, Malarmé, Rimbaud, and Verlaine belong, appears to lay a great deal of stress on the so-called meaning of colours. The school evidently includes both coloured hearers and coloured thinkers; but, whereas, the majority of coloured thinkers derive no particular meaning from their psychochromes, the symbolists attach considerable significance to the colours which happen to be associated with their thoughts. The different vowels, for instance, mean to them or represent for them particular emotions or states of mind not in virtue of the sound of the vowel but entirely through the related colour. The particular emotion symbolized by any given colour seems to the ordinary person rather arbitrary if we judge by the details in Rimbaud's poem; but we are aware that there has always been a tendency to represent emotional states in terms of the language of colour. Homer spoke of "black pains"; we constantly speak of a black outlook, a black lie, a white lie, a black record, a grey life, a colourless life, and so on. There is, in fact, growing up in England a school of musicians who hold that it should be possible and pleasurable to represent music chromatically. Whether the general public will ever enjoy silent music seems very doubtful, but it is notorious that most people derive a great deal of pleasure from the display of coloured lights, illuminated vapours, coloured steam, "fairy fountains", Bengal lights, a house on fire, and similar exhibitions in the open air. People undoubtedly do like to see great surfaces or masses vividly coloured as in the rainbow, the sunrise or sunset, the afterglow on snowy mountains, the streamers of the northern lights, and so forth. But whether they would care to have audible music suppressed and to have offered them a succession of coloured surfaces or patches of colour even following one another in the se-

quence or rythm required by music, is open to serious question. Such, however, is the intention of Mr. A. W. Rimington, as explained in his book, "Colour in Music",<sup>(63)</sup> in which there is much that is true and interesting. "It is undeniable," he writes, "that as a nation our colour sense is practically dormant . . . Compare our colour sense with that possessed by the Japanese, the Indians, or even the Bulgarians and Spaniards. . . To my mind, a wide-spread, refined colour-sense is more important than a musical one." Long before Mr. Rimington's work was published, there appeared a little book privately printed at Leith in Scotland called "Chromography or tone-colour music"<sup>(23)</sup>. The author assigned a colour to each of the notes of the scale thus—do = red, re = orange; mi = yellow; fa = green; sol = blue; la = violet-purple; ti = red-purple.

Many persons have synæsthesia in connexion with musical tones (sound-photisms); two cases reported by Albertoni<sup>(24)</sup> associated blue with the sound of Do (C); yellow with Mi (E); and red with Sol (G). But it was discovered that they were colour-blind for red (Daltonism). Now, whereas, they could recognize and name the other notes, they could not name G, a disability which Albertoni thinks was related to the Daltonism; he has accordingly called it Auditory Daltonism (Daltonismus auditivus), a psychical deafness depending on the red-blindness since the note to which they were psychically deaf was the one which called up mentally the particular colour, red, to which they were actually blind.

It might be now asked whether we have any explanation of the causes or causal conditions of coloured thinking; why may thoughts be coloured at all; and why should particular thoughts come to be associated with particular colours? Why should only a few persons, about 12 per cent. in fact, be found to be coloured thinkers? The answers, if answers they can be called, are disappointing in the extreme,



for we have no satisfactory explanations of any of these matters. The very arbitrariness of the associations defies theoretical analysis.

If it is the function of science merely to describe, then our work is done; but in a subject such as this, to make no attempt to account for the abstruse phenomena observed would be a distinctly feeble conclusion of our studies. It has been suggested that the case of coloured thinking is no more recondite than the influence of some picture-book or paint-box, which in early life determined for us ever afterwards the colours of certain concepts. Now, though many people do regard their coloured thinking as a childish survival, the picture-books will account for very few of the best established psychochromes. In some few cases, environmental influences do seem to have been casual. Thus, in one case known to the writer, the colour of February as white was accounted for by the influence of the surroundings. The earliest February remembered was snowy, and through the whiteness of the snow the concept of February came to be and ever afterwards remained white. But it is clear that if environmental influences are operative in anything like a large number of cases, the colours for such concepts as the months of the year ought to be far more uniform than they are. No common origin of external source can make one person think of August as white, another as brown and yet another as crimson. If August is white to one person because it is the month of white harvest, then it ought to be white to all persons capable of receiving any impressions as to the colours of harvest. But to the vast majority of people it is perfectly absurd to talk of August having any colour at all; and to the few who think it coloured, it has not by any means the same colour; all seems confusion.

Monsieur Peillaube<sup>(54)</sup> has made a suggestion of a different kind as likely to explain some of these colour associations.

Monsieur Peillaube became acquainted with a Monsieur Ch—— who had *audition colorée* as well as colored thinking. Monsieur Ch—— had an excellent memory and was able to submit his conceptions to searching introspection with the result that he seems to have discovered what may be called the missing link in the associational chain of mental chromatic events. To this coloured thinker the lower notes of the organ were of a violet colour. This seems to have been brought about in the following way: low notes of any kind were sweet and deep (*douces et profondes*), the colour violet is sweet and deep, therefore it came to pass that the low notes were associated with violet. Similarly, to Monsieur Ch—— the vowel sound of “i” was suggestive of something “*vive et gaie*,” the colour green had always been associated with liveliness and gaiety, therefore he thought the vowel “i” was green. These conclusions were reached only after considerable introspection, for it must be understood that the link between the low notes and the colour violet was by no means an explicit or definite presentation in this person’s mind, at the time that Monsieur Peillaube suggested the enquiry. Peillaube’s theory, then, is, that these apparently arbitrary and instantaneous linkings of sounds (x) to colours (y) or of thoughts to colours, are really, after all, cases of association of two terms through the intermediation of a third factor an emotional link (l) now subconscious but revivable. The sequence was x-l-y, but in course of time the “l” had dropped out of consciousness leaving the “x” and the “y” apparently indissolubly joined together.

Finally it may be asked, would the capability of coloured thinking cause its possessor to be classed as mentally abnormal. The answer is in the negative. Coloured thinkers may not conform to the usual or most commonly met with mental type, but they deviate from that type only in the same way that geniuses deviate from it. Inasmuch as they

deviate from the normal, coloured thinkers are, of course, abnormal, but there is nothing in them allied to instability of mental balance. Some coloured thinkers may, no doubt, belong to families in which some degree of mental instability is present, or, on the other hand, some relatives of coloured thinkers may possess a high degree of artistic or musical ability, of scientific or philosophical insight, that quality in fact, of genius so exceedingly difficult to define. Genius is something notoriously not conferred by training or education, if not inborn it cannot be acquired; exactly the same may be said of coloured thinking. Our studies have at least shown us this, that it is not in the ordinary type of mental constitution but in the recesses of the slightly supernormal that this recondite problem of psychology presents itself for analysis and explanation.

## APPENDIX

Being the psychochromes in an actual case.

- a.—blue-white (like a dead tadpole).
- b.—dark brown-red.
- c.—brighter red.
- d.—pea-green.
- e.—fawn-yellow.
- f.—a yellow, brighter than e.
- g.—dark brown, nearly black.
- h.—black.
- i.—chocolate brown.
- j.—a dull red (not the same shade as the other reds).
- k.—bright brick-red.
- l.—black.
- m.—bright yellow.
- n.—dark brown (nearly black).
- o.—white.
- p.—white with just a tinge of blue.
- q.—pale blue-green.
- r.—black (nearer to h than to l).

- s.—white.
- t.—mustard colour (ugly).
- u.—brown-yellow.
- v.—olive green.
- w.—red (like c).
- x.—green.
- y.—an ugly yellow.
- z.—very bright scarlet.

- Sunday.—red.
- Monday.—pea-green.
- Tuesday.—fawn yellow.
- Wednesday.—black.
- Thursday.—fawn (not as bright as Tuesday).
- Friday.—green (a very ugly bile colour).
- Saturday.—white.

- January.—dull red.
- February.—fawn.
- March.—a green mustard colour.
- April.—blue white.
- May.—sunshine colour
- June.—dull red.
- July.—a slightly darker red.
- August.—olive green (more yellow than n).
- September.—white.
- October.—green.
- November.—black brown.
- December.—a blue shot with green.
- Christmas.—white.
- Whitsun.—nearly a rose pink.
- Easter.—black with something white in the middle.

- One.—black.
- Two.—blue-white.
- Three.—fawn.

- Four.—dark red.  
 Five.—white.  
 Six.—bright yellow.  
 Seven.—black.  
 Eight.—white.  
 Nine.—green.  
 Ten.—mustard-green.  
 Eleven.—brown-yellow-green.  
 Twelve.—pale brown.

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